CLAIM AMENDMENTS

1. (Currently amended) A sensor package comprising:

a) vertical sensor circuit component comprising a first face, a second face, a bottom edge, a top edge, two side edges, input/output (I/O) pads and at least one sensitive direction wherein the I/O pads are arranged on the second face of the vertical sensor circuit component; and

b) a horizontal sensor circuit component comprising a top face, a printed circuit board (PCB) mounting face, a vertical sensor circuit component interface edge, at least two or more other edges, and at least one sensitive direction orthogonal to the sensitive directions of the vertical sensor circuit component,

wherein the vertical sensor circuit component interface edge of the horizontal sensor circuit component connectively supports the vertical sensor circuit component along the Z axis; and

wherein the first face comprises I/O pads for conductive connection to the horizontal sensor circuit component.

2. (Original) The sensor package of claim 1 wherein the distance between the bottom edge and the top edge of the vertical sensor circuit component is about 1.1mm.

3. (Original) The sensor package of claim 1 wherein the distance between the bottom edge and the top edge of the vertical sensor circuit component is less than about 1.1mm.

4. (Currently amended) The sensor package of claim 1 wherein the I/O pads on the ~~of the~~ vertical sensor circuit component are arranged in an array.

5. (Original) The sensor package of claim 1 wherein the I/O pads on the vertical sensor circuit

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component are compatible with a method selected from the group consisting of wire bonding, flip chip, solder bumping, stud bumping, conductive epoxy, flexible interconnect bonding, and tape automated bonding (TAB) techniques.

6. (Cancelled).

7. (Currently amended) The vertical sensor circuit component of claim 1 ~~6~~ wherein the I/O pads are compatible with a method selected from the group consisting of wire bonding, flip chip, solder bumping, stud bumping, conductive epoxy, flexible interconnect bonding, and tape automated bonding (TAB) techniques.

8. (Original) The sensor package of claim 1 wherein the vertical sensor circuit component and the horizontal sensor circuit component are solid state sensors.

9. (Original) The sensor package of claim 1 wherein the vertical sensor circuit component and the horizontal sensor circuit component are magnetic sensors.

10. (Original) The sensor package of claim 1 wherein the vertical sensor circuit component and the horizontal sensor circuit component are tilt sensors.

11. (Currently amended) The sensor package of claim 1 wherein the vertical sensor circuit component comprises a sensor and the horizontal sensor circuit component comprises a solid state chip with ~~a~~ the vertical sensor circuit component interface edge.

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12. (Currently amended) A sensor package comprising:

a) vertical sensor circuit component comprising a first face, a second face, a bottom edge, a top edge, two side edges, input/output (I/O) pads and at least one sensitive direction wherein the I/O pads are arranged on the second face of the vertical sensor circuit component; and

b) a horizontal sensor circuit component comprising a top face, a printed circuit board (PCB) mounting face, a vertical sensor circuit component interface edge, at least two or more other edges, and at least one sensitive direction orthogonal to the sensitive directions of the vertical sensor circuit component,

wherein the vertical sensor circuit component interface edge of the horizontal sensor circuit component connectively supports the vertical sensor circuit component along the Z axis; and

~~The sensor package of claim 1~~ wherein the vertical sensor circuit component is conductively connected to the horizontal sensor circuit component.

13. (Allowed) A method for mounting a vertical sensor circuit component with a first and second face, a bottom, a top and two side edges, and I/O pads arranged on the second face to a PCB comprising:

a) connecting the bottom edge of the vertical sensor circuit component to the PCB; and

b) connecting the first face of the vertical sensor circuit component to a vertical sensor circuit component interface edge of one or more horizontal sensor circuit components comprising a top face, a PCB mounting face, a vertical sensor circuit component interface edge, and at least two other edges, wherein the horizontal sensor circuit component is connected to the PCB;

wherein the vertical sensor circuit component interface edge of the horizontal sensor circuit component to which the vertical sensor circuit component is connected supports the vertical sensor circuit component along the Z axis.

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14. (Allowed) The method of claim 13 wherein the vertical sensor circuit component is conductively connected to the PCB by a method selected from the group consisting of wire bonding, flip chip, solder bumping, stud bumping, conductive epoxy, flexible interconnect bonding, and tape automated bonding (TAB) techniques.

15. (Allowed) The method of claim 14 wherein the vertical sensor circuit component is conductively connected to the PCB by conductive epoxy, solder bumping or stud bumping techniques.

16. (Allowed) The method of claim 13 wherein the vertical sensor circuit component and the one or more horizontal sensor components are diced wherein the edges are substantially perpendicular to the faces.

17. (Currently amended) A method for making a multi-axis magnetometer for measuring the magnetic field intensity along at least two orthogonal axes comprising:

a) mounting one or more magnetic field sensing circuit components comprising a top face, a PCB mounting face, a vertical magnetic sensor circuit component interface edge, and two or more other edges, by their PCB mounting face to a PCB; and

b) mounting to the PCB a vertical magnetic sensor circuit component comprising a first face, a second face, a bottom edge, a top edge, two side edges, input/output (I/O) pads and at least one sensitive direction wherein the I/O pads are arranged on the second face of the vertical sensor circuit component;

wherein the vertical magnetic sensor circuit component is attached to and supported by the

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at least one magnetic field sensing circuit component; and

wherein the vertical magnetic sensing circuit component is conductively connected to the magnetic field sensing circuit component.

18. (Original) The method of claim 17 wherein the magnetic field sensing circuit component is one or more horizontal sensor circuit components.

19. (Original) The method of claim 17 wherein the magnetic field sensing circuit component is one or more horizontal, 1-dimensional sensor circuit components.

Claims 20-23 (cancelled).

24. (Currently amended) The method of claim 17 ~~23~~ wherein the conductive connection is formed with an adhesive.

25. (Original) The method of claim 24 wherein the adhesive is conductive epoxy.

26. (Original) A multi-axis magnetometer for measuring the magnetic field intensity along at least two orthogonal axes produced according to the method of claim 17.

27. (Original) The multi-axis magnetometer for measuring the magnetic field intensity along three orthogonal axes of claim 26, further comprising a tilt sensor.

28. (Original) The multi-axis magnetometer for measuring the magnetic field intensity along three

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orthogonal axes of claim 26 wherein the vertical magnetic sensor circuit component is about 1.1 mm in height above the PCB.

29. (Original) The multi-axis magnetometer for measuring the magnetic field intensity along three orthogonal axes of claim 27 wherein the vertical magnetic sensor circuit component is about 1.1 mm in height above the PCB.

30. (Original) The multi-axis magnetometer for measuring the magnetic field intensity along three orthogonal axes of claim 26 wherein the vertical magnetic sensor circuit component is less than about 1.1 mm in height above the PCB.

31. (Original) The multi-axis magnetometer for measuring the magnetic field intensity along three orthogonal axes of claim 27 wherein the vertical magnetic sensor circuit component is less than about 1.1 mm in height above the PCB.

32. (New) A sensor package comprising:

a) vertical sensor circuit component comprising a first face, a second face, a bottom edge, a top edge, two side edges, input/output (I/O) pads and at least one sensitive direction wherein the I/O pads are arranged on the second face of the vertical sensor circuit component; and

b) a horizontal sensor circuit component comprising a top face, a printed circuit board (PCB) mounting face, a vertical sensor circuit component interface edge, at least two or more other edges, and at least one sensitive direction orthogonal to the sensitive directions of the vertical sensor circuit component, wherein the horizontal sensor circuit component is connected to the PCB,

wherein the vertical sensor circuit component interface edge of the horizontal sensor circuit

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component connectively supports the vertical sensor circuit component along the Z axis.

33. (New) The sensor package of claim 32 wherein the vertical sensor circuit component is non-conductively connected to the horizontal sensor circuit component.

34. (New) The sensor package of claim 33 wherein the non-conductive connection is formed with an adhesive.

35. (New) The sensor package of claim 34 wherein the adhesive is non-conductive epoxy.

36. (New) The sensor package of claim 32 wherein the vertical sensor circuit component is conductively connected to the horizontal sensor circuit component.

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AMENDMENTS TO THE SPECIFICATION

Please amend the specification at page 12, line 1 to line 7 to read as follows:

~~Figure 2A~~ Section A of Figure 2 illustrates a sensor package wherein two horizontal, 1-dimensional, sensor circuit components are mounted separately in space on the PCB, with only one of the two sensor circuit components serving as a support for the vertical sensor circuit component 103. ~~Figure 2B~~ Section B of Figure 2 illustrates a sensor package wherein the two horizontal, 1-dimensional, sensor circuit components 204 are in contact, conductively or non-conductively attached, with both serving as a support for the vertical sensor circuit component 103.

Please amend the specification at page 14, line 20 to page 15, line 1 to read as follows:

Such exemplary electrical connections are represented by wire bonds or TAB bonds 105 between the horizontal sensor circuit component 102, 204 and the PCB 101 in section A of Figure 3 ~~Figure 3 (A)~~, solder joints 105 between the vertical sensor circuit component 103 and the PCB 101 in sections A and C of Figure 3 ~~Figure 3 (A) and (C)~~, and stud bumps encased in conductive epoxy 105 between the vertical sensor circuit component 103 and the PCB 101 in section B of Figure 3 ~~Figure 3 (B)~~.

Please amend the specification at page 16, line 22 to page 17, line 1 to read as follows:

Similarly, for embodiments such as that illustrated in section B of Figure 2 ~~Figure 2(B)~~, any of the sensor components 103, 204 can be in direct electrical communication with any other sensor component to which it is abutted.

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Please amend the specification at page 18, line 5 to line 13 to read as follows:

Similarly, a sensor component fixture 107 can be utilized with embodiments such as that illustrated in section B of Figure 2 ~~Figure 2(B)~~, wherein all sensor components 103, 204 are in direct electrical or non-electrical communication. As with Figures 4 and 5, the methods of forming electrical interconnections 105 outlined above are preferably utilized separately but can be utilized simultaneously.

Figure 7 is a schematic diagram of an exemplary vertical die chip-on-board sensor package where an array of I/O pads 702 is arranged on the second face of a vertical sensor circuit component (analogous to section C of Figure 3 ~~Figure 3 (C)~~), in this exemplary case orthogonal to the sensitive direction of the vertical sensor circuit component.

Please amend the abstract to the specification at page 32, line 1 to line 5 to read as follows:

Methods and apparatus for vertical die chip-on-board sensor packages ~~are provided. Such vertical die chip-on-board sensor packages~~ can comprise a vertical sensor circuit component comprising a first face, a second face, a bottom edge, a top edge, two side edges, input/output (I/O) pads and at least one sensitive direction wherein the I/O pads are arranged near the bottom edge.

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